REMARKS

Entry of the foregoing and reconsideration of the application identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.111 and in light of the remarks which follow, are respectfully requested.

By the above amendments, claims 1 and 4 have been amended for clarification purposes to recite that all the discotic liquid crystal molecules are essentially vertically aligned. Support for these amendments can be found in the instant specification at least at page 42, lines 2-6. Claim 7 has been amended for readability purposes by replacing "the" with "a" prior to the term "transparent axis." Claim 8 has been amended for readability purposes by replacing "-NH" with "-NH-." New claim 13 has been added which is directed to an addition aspect of the present invention. Support for new claim 13 can be found in the instant specification at least at page 42, lines 2-6.

In the Official Action, claim 7 stands rejected under 35 U.S.C. §112, second paragraph, for reciting "the" prior to the term "transparent axis." In an effort to expedite prosecution, claim 7 has been amended to recite "a transparent axis." Accordingly, withdrawal of this rejection is respectfully requested.

Claims 1-7 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,990,997 (*Jones et al*). Withdrawal of this rejection is respectfully requested for at least the following reasons.

According to one aspect of the present invention as defined by claim 1, an optically anisotropic sheet is provided comprising an optically anisotropic layer formed from discotic liquid crystal molecules, an orientation layer subjected to rubbing treatment and a transparent

support in this order. All the discotic liquid crystal molecules are essentially vertically aligned and an average direction of optical axes of the discotic liquid crystal molecules is essentially parallel to a rubbing direction of the orientation layer.

According to an additional aspect of the present invention, a rolled polarizing plate is provided (see, e.g., claim 4).

Jones et al relates to a normally white liquid crystal display including tilted and negative optical compensators or retarders (col. 1, lines 9-11). *Jones et al* discloses negative tilted anisotropic optical retarders or compensators, for example, "made of a compound having a discotic structure unit in its molecule such as a discotic liquid crystalline compound having low molecular weight such as monomer and a polymer obtained by polymerization of a polymeric discotic LC compound" (col. 6, lines 48-53).

Jones et al does not disclose each feature of aspects of the present invention defined by claims 1 and 4. For example, *Jones et al* does not disclose an optically anisotropic layer formed from discotic liquid crystal molecules, wherein all the discotic liquid crystal molecules are essentially vertically aligned, as recited in claims 1 and 4.

Jones et al discloses that the polar angle θ of each of the tilted retarders varies, either continuously or intermittently in either direction, throughout the thickness of the film (col. 7, lines 4-7).[1] *Jones et al* further discloses the following at column 7, lines 8-18:

> For example, the tilt angle θ of one or both of retarders 2 and 6 may vary continuously from about 5° to 65° through the thickness of the layer. In certain embodiments, the inclined or polar angle θ varies within the range of from 5° to 85° . . . while

[1] *Jones et al* at column 6, lines 59-64, defines the polar angle, i.e., the tilted or inclined angle θ, as the angle "between (i) the direction normal to the disc-like molecules of the retarder, and (ii) the direction normal to the display."

> the minimum polar angle θ in the film . . . is in the range of from about 0° to 85° . . . and the maximum polar angle θ is . . . from about 5° to 90° . . .

Furthermore, examples 1 and 2 of *Jones et al* employ retarders having a tilt angle θ which varies throughout the thickness of the layers from 60° on the side furthest from the liquid crystal layer down to approximately 3° on the side closest to the liquid crystal layer (col. 12, lines 30-34; col. 13, lines 36-39). Clearly, the disc-like molecules of *Jones et al* which have polar angles that vary through a wide range of angles, are not the same as the recited discotic liquid crystal molecules which are all essentially vertically aligned. *Jones et al* simply has no disclosure of such feature.

For at least the reasons discussed above, *Jones et al* does not constitute an anticipation of the presently claimed invention. Accordingly, withdrawal of the §102(b) rejection is respectfully requested.

Claims 1-7 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,184,957 (*Mori et al*). Withdrawal of this rejection is respectfully requested for at least the following reasons.

Mori et al discloses a liquid crystal display having a basic structure comprising a liquid crystal cell which comprises a pair of transparent substrates at least one of which is provided with an electrode thereon and liquid crystal sealed therebetween (col. 5, lines 3-7). *Mori et al* also discloses that an optical compensatory sheet is provided "between at least one side of the liquid crystal cell" (col. 5, lines 8 and 9). Referring to FIG. 2(a), the liquid crystal display of *Mori et al* includes, *inter alia*, liquid crystal molecules 26a, and optical compensatory sheets 22a and 22b (col. 5, lines 38-50).

Mori et al does not disclose each feature of aspects of the present invention defined by claims 1 and 4. For example, *Mori et al* does not disclose an optically anisotropic layer formed from discotic liquid crystal molecules, wherein all the discotic liquid crystal molecules are essentially vertically aligned, as recited in claims 1 and 4.

In this regard, the Patent Office has taken the position that the liquid crystal disclosed by *Mori et al* at column 5, lines 3-14, is the same as the claimed discotic liquid crystal molecules (Official Action at page 4). However, *Mori et al* discloses that such liquid crystal is present in a liquid crystal cell and is sealed between a pair of transparent substrates, and that an optically compensatory sheet is "provided between at least one side of the liquid crystal cell" (col. 5, lines 4-9). Clearly, the liquid crystal of *Mori et al* relied upon by the Patent Office is not the same as the discotic liquid crystal molecules which form the optically anisotropic layer, because *Mori et al* has no disclosure that such liquid crystal forms an optically anisotropic layer.

Moreover, *Mori et al* fails to disclose an optically anisotropic layer formed from discotic liquid crystal molecules, wherein all the discotic liquid crystal molecules are essentially vertically aligned, as recited in claims 1 and 4.

For at least the reasons discussed above, *Mori et al* does not constitute an anticipation of the presently claimed invention. Accordingly, withdrawal of the §102(e) rejection is respectfully requested.

Claims 8-12 stand rejected under 35 U.S.C. §103(a) as being obvious over *Mori et al* or *Jones et al*, either in view of U.S. Patent No. 6,081,312 (*Aminaka et al*). Withdrawal of this rejection is respectfully requested for at least the following reasons.

According to one aspect of the present invention as defined by claim 8, a process for orienting discotic liquid crystal molecules is provided. The process comprises the steps of: coating a solution of a copolymer comprising repeating units represented by the formula (I) and repeating units represented by the formula (II) on a support to form a coated layer; rubbing a surface of the coated layer to form an orientation layer; coating a solution containing discotic liquid crystal molecules on the orientation layer to orient the discotic liquid crystal molecules so that an average inclined angle of discotic planes of the discotic liquid crystal molecules is in the range of 50° to 90° and that an average direction of optical axes of the discotic liquid crystal molecules is essentially parallel to a rubbing direction of the orientation layer:

(I) $-(CH_2-C(R^1))_x-$ with R^1 on the backbone carbon and $COOM$ on the side chain

(II) $-(CH_2-C(R^2))_y-$ with $L^1\text{-}Ar^1\text{-}(L^2\text{-}Ar^2)_m\text{-}(L^3\text{-}Ar^3)_n\text{-}L^4\text{-}Ar^4$ on the side chain

in which each of R^1 and R^2 independently is hydrogen, a halogen atom or an alkyl group having 1 to 6 carbon atoms; M is an alkali metal ion; L^1 is a divalent linking group selected from the group consisting of -O-, -CO-, -NH-, an alkylene group and a combination thereof; each of L^2, L^3 and L^4 independently is a single bond or a divalent linking group selected from the group consisting of -O-, -CO-, -NH-, $-SO_2-$, an alkylene group, an alkenylene group, an alkynylene group and a combination thereof; each of Ar^1, Ar^2, Ar^3 and Ar^4 independently is an aromatic ring, which can have a substituent group; each of m and n independently is 0 or 1; x is 10 to 95 mole %; and y is 5 to 90 mole %.

As acknowledged at page 5 of the Official Action, *Jones et al* and *Mori et al* fail to disclose or suggest the copolymer comprising repeating units represented by the formula (I) and repeating units represented by the formula (II), as recited in claim 8.

Aminaka et al fails to cure the above-described deficiency of *Jones et al* and *Mori et al*. In particular, *Aminaka et al* fails to disclose or suggest the formula (I) repeating unit recited in claim 8. In this regard, the Patent Office has asserted that the formulas disclosed at column 19 of *Aminaka et al* correspond to the claimed formula (I) and formula (II) repeating units. However, in stark contrast with *Aminaka et al*, the formula (I) repeating unit contains "-COOM," wherein M is an alkali metal ion. *Aminaka et al* simply has no disclosure or suggestion of the formula (I) repeating unit which contains such "-COOM," as recited in claim 8.

Furthermore, *Aminaka et al* fails to disclose or suggest the formula (II) repeating unit recited in claim 8. In this regard, the formula (II) repeating unit has at least two aromatic rings, i.e., Ar^1 and Ar^4. By comparison, the second formula set forth at column 19 of *Aminaka et al* appears to have only one aromatic ring. Clearly, *Aminaka et al* fails to disclose or suggest the claimed formula (II) repeating unit.

For at least the above reasons, it is apparent that no *prima facie* case of obviousness has been established with regard to claim 8. Accordingly, withdrawal of the §103(a) rejection is respectfully requested.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order, and such action is earnestly solicited.

If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: _____
Roger H. Lee
Registration No. 46,317

P.O. Box 1404
Alexandria, VA 22313-1404
(703) 836-6620

Date: October 24, 2003